EXECUTIVE SUMMARY

FIS 03-007: Eek Lake Sockeye Salmon (*Oncorhynchus nerka*) Stock Assessment

Investigator(s):

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Project Dates: 1 June 2003 to 15 Oct. 2003

Geographic Area: Southeast Alaska, Southwest Prince of Wales Island, Tongass National Forest

Information Type: Stock Status/Trends (SST)

Issue: There is a long history of sockeye salmon subsistence harvest from Hetta Inlet by the community of Hydaburg. The main sockeye salmon runs in Hetta Inlet are Hetta Lake and Eek Lake (Figure 1). Hetta Lake is one of the few systems on Prince of Wales Island that historically supported large runs of sockeye salmon. When Hetta Lake fails to produce enough subsistence for Hydaburg residents, fishing effort is shifted to the Eek Lake system. With a noticeable decline in both systems, the harvest pressure that Eek Lake sockeye salmon has felt in the past few years may negatively affect future sockeye salmon sustainability. In 2001, Hetta Lake Project personnel noticed that the sockeye salmon being caught at Eek Lake were getting darker and darker. This was due to a natural blockage of the Eek Lake outlet stream that prevented sockeye salmon from migrating into the lake. The sockeye salmon that were trapped in the bay were subject to heavy fishing pressure because of that blockage. The community of Hydaburg is concerned that the Eek Lake sockeye stock may be in critical condition, and some type of monitoring is needed to ensure that the system does not end up over-fished to the point of sockeye salmon decimation. Add the above concerns to the fact that more and more subsistence users are coming to Eek Inlet to fill their subsistence needs; the community of Hydaburg has a crisis on hand.

Objectives: The objectives for the Eek Lake Sockeye Stock Assessment will mirror the on-going Hetta Lake Sockeye Stock Assessment Project objectives:

1) Estimate the annual sockeye escapement into Eek Lake using a mark-recapture program that includes construction of a long-term escapement index using pre-determined timing of foot escapement surveys of the spawning grounds.
2) Sample adult sockeye salmon returns for age (scale), sex, and size (length).
3) Estimate the annual sockeye subsistence harvest of Eek Inlet sockeye salmon with a creel census program in conjunction with the Hetta Lake Project.
4) Estimate the in-lake productivity of Eek Lake using established ADF&G limnological sampling procedures.
5) Write project technical reports.

Long term objectives conditional on continued funding:

Objective 1 (after three to five years): Make initial estimates of biological escapement goal ranges and sustainable escapement thresholds for sockeye salmon based on current estimates of adult escapements, rearing juvenile densities, in-lake productivity, and limnology-based habitat capacity modeling.

Objective 2 (after five years of brood-year returns): Refine these escapement goals using the estimates of spawners and recruits collected by this project and refine these goals as additional years of data becomes available.

Methods:

The investigators will be conducting mark-recapture studies to estimate the sockeye salmon escapement to the study area in Eek Lake. There will be five mark-recapture sapling attempts, occurring over the entire spawning period, approximately every two weeks. At the beginning of each trip, the number of spawners around the lake and in the tributaries will be estimated to provide an escapement index. The age and size characteristics of the sockeye escapement will be collected a t Eek Lake during the mark-recapture studies to describe the biological structure of the population . The goal is to collect 600 samples through the spawning season. Subsistence harvest will be estimated through a creel survey. The HCA local hire technicians will interview subsistence fishers both at Eek Lake outlet and the harbor to generate a harvest estimate. In-lake productivity of Eek Lake will be estimated using established ADFG limnological sampling procedures. Samples will be collected every six weeks throughout the summer season to measure euphotic zone depth and to collect zooplankton samples.

Products: The ADFG, in collaboration with the HCA and Federal agencies, will prepare two semi-annual progress reports and one annual report detailing accomplishments and results of the Eek Lake Project. The reports will be provided at the conclusion of the study and delivered to the Office of Subsistence Management, Information Services Divisions

Experience of Investigators: The Hydaburg Cooperative Association has successfully completed one year of partnership with the USFS and ADFG conducting the Hetta Lake Sockeye Salmon Stock Assessment. The Hydaburg Cooperative Association posted notice of job availability, interviewed potential employees, hired two Fish Tech II, and contributed hours of administrative time towards the project.

The Alaska Department of Fish and Game, Commercial Fisheries Division staff has a well-developed process of fisheries research planning, execution, and reporting. Staff

includes Biologists, Biometricians, Limnologists, and Technicians who have all had numerous years of experience in dealing with field work with sockeye salmon, lake productivity, and harvest enumeration and methods. Lead Biologists have numerous published reports, as well as numerous publications from all staff on weir operations, mark-recapture estimates, spawning enumeration, hydroacoustics, smolt investigations, and limnological investigations.

Partnership and Capacity Development: The Hydaburg Cooperative Association is committed to monitoring and managing local subsistence resources. With an opportunity to partner with the USFS and ADFG, the HCA will learn what types of steps to take to become self-sufficient in monitoring the local sockeye subsistence harvests to ensure strong sockeye runs in the future. The project would also allow the HCA to increase the local management capacity through the hire of two more employees to monitor subsistence harvest of sockeye salmon. This project will also promote interaction and cooperation between HCA, the people of Hydaburg, and the ADF&G, thereby creating a positive working relationship between a major subsistence group and state and federal management groups on the Prince of Wales Island.

The Eek Lake sockeye project will be operated as a sub-unit of the SSE subsistence program. Program will be lead by the ADFG Southeast Alaska Subsistence Fisheries Program Manager (Fisheries Biologist III). Project staff will be lead by the SSE Subsistence Fisheries Project Manager (Fisheries Biologist II), and a field staff 1 field team leader (Fisheries Biologist I) and 2 local hires at the Fish and Wildlife Tech II equivalent. This will allow for staff to be used on all sub-projects as needed, with little or no overtime throughout the field season. ADFG project biologists will be responsible for project design, data collection oversight, data analysis and reporting. HCA local hire technicians will receive training in project operations and participate in all components of the project including data collection, recording, entry, and management.

Project Budget:

Category	**FY 2003**
Direct Costs:	
Personnel	32,667
Travel	3,600
Contractual	0
Materials and Supplies	5,240
Equipment	3,000
Indirect Costs:	13,916
Project Total	**58,423**
Selected Summaries	
HCA Local Hire	24,792
HCA Indirect	$10,668